

**INTERMODULATION SUPPRESSION FOR TRANSMIT ACTIVE
PHASED ARRAY MULTIBEAM ANTENNAS WITH SHAPED BEAMS**

ABSTRACT OF THE DISCLOSURE

Methods and apparatus are provided for determining aperture phase distributions for use in radiating signals with an active phased array antenna having multiple beams and multiple carriers. Distinct initial phase distributions corresponding to the carriers are allocated. The initial phase distributions are modified for each of the carriers to generate respective radiation patterns that substantially correspond to respective coverage areas in accordance with amplification and radiation of signals having the initial phase distributions. The modified phase distributions are optimized to simultaneously increase carrier-signal power and reduce an intermodulation product radiated in the respective coverage areas in accordance with amplification and radiation of signals having the modified phase distributions.

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